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ABSTRACT

The relationship between the ability of elementary pupils to blend phonemes in nonsense syllables and their silent reading achievement was examined. An original test designed to measure phoneme blending of nonsense syllables was administered to 252 boys and girls randomly selected from grades 1 through 6 and from a wide ethnic and socioeconomic range of New York City schools. The odd-even technique established the reliability of the instrument at a coefficient of .88. Results showed (1) a .66 relationship between phoneme blending and silent reading achievement for 105 boys in grades 2 through 6; (2) a .56 relationship between blending and achievement for 105 girls in grades 2 through 6; (3) a highly significant relationship between phoneme blendings and age, and between phoneme blending and ethnic origin for the total sample of 252; and (4) a nonsignificant relationship between phonemes blending and sex. Implications of the study and suggestions for further research are also included. (VJ)

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PHONEME BLENDING AND SILENT READING ACHIEVEMENT

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I. PURPOSE OF THE STUDY

The study here described was undertaken to develop an instrument to measure the variable "phoneme blending of nonsense syllables" and to investigate the relationship of this variable to silent reading achievement by measuring it among elementary school children and then examining it in relation to the children's reading achievement.

II. THE NATURE OF PHONEME BLENDING

A survey of the literature pertinent to the present study indicated that the factor of phoneme blending has not been clearly defined, understood, or measured. The questions of whether blending can be taught, how it is related to intelligence, its relation to auditory abilities, whether it is a unitary function or may derive from more than one source, and, importantly, its relation to reading achievement, have never been fully answered.

One major source of confusion is revealed by the variety of terms which have been applied to this ability (auditory blending, auditory synthesis, smoothing, sound blending, vocal phonics, etc.), all of which overlook the specifically linguistic nature of the units to be blended. The process of blending, in almost every case, requires the ability to change the given allophone of a phoneme into another allophone of the same phoneme, according to its position in the completed syllable. Thus, the /t/ that is pronounced when the word "cat" is presented in its unblended from (c-a-t) is very different from the /t/ that is pronounced when the word is correctly synthesized (cat). What actually occurs, then, is the combining of phonemes, rather than of "sounds" or of "auditory" units, which is why the term phoneme blending has been used here.

A second source of confusion about phoneme blending refers to its physiological origins. It has often been assumed that it is a function of the peripheral nervous system, much in the manner of auditory acuity and auditory discrimination, and a number of investigations have included phoneme blending as one of several auditory factors. For some time, however, there has been evidence to indicate that blending ability is a function of the central nervous system, and is highly specific. In 1970, Geschwind reported several cases of adults who, due to brain injury, had lost the ability to read written words, but were able to read numbers. In such a case, the written word "six" would not be recognized, while the written number "6" would be, since it is a logogram, rather than alphabetic, and does not require the blending of phonemes. Similarly, Zerbin-Rudin reports the case of a Japanese boy with reading difficulty in the "Kana" or alphabetic Japanese writing system who had minimal difficulty in the "Kanji" or logogramic writing system. Although both Geschwind and Zerbin-Rudin reported after the present study was completed, their data is neat confirmation of the discrete and (non-"auditory") nature of phoneme blending.

III. PHONEME BLENDING AND READING ACHIEVEMENT

When studies of the relationship between phoneme blending and reading were examined, it was found that, although there had been awareness of this factor among investigators in the field of reading as early as 1790, relatively few controlled studies are available. While these tended to indicate a positive relation between the two factors, there was some disagreement on the matter. In addition, questions were raised about the validity of the findings because of the tests that had been used to measure blending.

IV. HYPOTHESES

For the present study, as a start toward the clarification of phoneme blending, three hypotheses were formulated and tested. The first hypothesis stated that, among elementary school boys, there would be a positive relationship between phoneme blending of nonsense syllables and silent reading achievement. In the second hypothesis, the same relationship was theorized for elementary school girls. Thirdly, it was hypothesized that the relationship between the two variables would be similar for both boys and girls.

V. PROCEDURE

An original test was devised to measure phoneme blending of nonsense syllables, since only tests to measure phoneme blending of meaningful words were in existence at the time of the study. Phoneme blending of nonsense syllables rather than of words was used to circumvent the possibility of children guessing at a whole word on the basis of several recognized sounds. In addition, the ability to blend sounds in unknown word syllables rather than in recognized or known words is an integral part of syllabication skill in reading. Therefore, a nonsense syllable blending test might help to identify children who are not progressing beyond early reading levels because they are hampered by blending difficulties which are not revealed by word blending tests.

Added features of the test included the presence of a wide range of phonemes in various positions within syllables, and, as a result of pilot administrations of several preliminary forms of the test, the elimination of items which contained phonemes that were prone to auditory discrimination confusion (th and TH are examples of such phonemes).

Validity and reliability were partially established for the test,

also as a result of the pilot studies.

The final form of the experimental test was then administered to 252 boys and girls, randomly selected from grades one to six in equal numbers of twenty-one boys and twenty-one girls from each grade. Care was taken to select a sample typical of the wide ethnic and socio-economic range of the total New York City school population.

Additionally, although no hypotheses had been formulated concerning them, the variables of age, sex, and ethnic origin were examined in relation to phoneme blending of nonsense syllables.

VI. RESULTS

The odd-even technique was used to establish reliability for the test and a coefficient of .88 was obtained. An item analysis was made for each item of the test, resulting in item discrimination and item difficulty indices. These indicated that the test items discriminated very well between high and low scorers and that the test was rather difficult for the sample population. This relative difficulty is an advantage, since the resultant high ceiling makes it suitable for older children.

Results of the study all support the basic hypotheses. A highly significant positive relationship (.66) between phoneme blending and silent reading achievement was found for the 105 boys in grades two through six. Similarly, a highly significant positive relationship (.56) between phoneme blending and silent reading achievement was found for the 105 girls in grades two through six. The difference between these two relationships was not significant.

Highly significant relationships between phoneme blending and age and between phoneme blending and ethnic origin were found for the sample of 252 children in grades one through six. The relationship between phoneme blending and sex was not significant.

VII. CONCLUSIONS

Conclusions reached on the basis of the results of the study include:

A. Phoneme blending of nonsense syllables can be reliably and validly measured.

B. There is a positive relationship between phoneme blending of nonsense syllables and silent reading achievement among elementary school children.

C. The sex of a child does not affect the relationship between phoneme blending and silent reading achievement.

D. The sex of a child does not affect the child's phoneme blending ability.

E. Older children, on the whole, are better blenders of nonsense syllables than are younger children, although there are children at every age who have difficulty with this ability. First grade children especially find phoneme blending of nonsense syllables difficult.

F. New York City children of European ethnic origin are better blenders of nonsense syllables than are New York City children of Negro or Latin American ethnic origin. The fact that the children in the study were New York City children is here emphasized because the reason for this difference in blending ability may very well be related to language and socio-economic factors which are more related to the implications inherent in the geographical location of a specific ethnic group than are related to the ethnic group itself.

VIII. IMPLICATIONS

Among implications which can be derived from the present study is a major implication for educational procedure. The question of the extent to which it results from normal maturational processes has not been settled.

However, in view of the high correlation between phoneme blending and reading, and as long as there is a good chance that this ability can respond to teaching, it behooves both classroom teachers and remedial reading teachers to determine the phoneme blending ability of their students and, wherever necessary, to incorporate phoneme blending instruction into their programs.

In addition, in view of the relationship between phoneme blending and age, teachers of the primary grades should be especially alert to blending instruction. However, since there were children of every age who had blending difficulty in the sample of the present study, teachers of the intermediate grades should also be alert to the importance of blending ability and determine the blending ability of children who are having reading difficulty. Instruction can then be given in those cases where blending difficulty is present, in order to help those children who can profit from such instruction.

Another implication may be derived from the finding of a significant relationship between blending and ethnic origin. In view of the relationship between blending and reading achievement, teachers of children of those ethnic origins which have been demonstrated to lesser blending ability should make extra efforts to incorporate blending instruction into their reading programs.

A final implication of the present study is in contradiction to the widely-held opinion among educators that girls are more proficient in language abilities than are boys. In the present study, both phoneme blending ability itself and the relationship between phoneme blending and silent reading achievement were not significantly different for boys and for girls. In fact, there was a non-significant trend in favor of the boys

regarding phoneme blending ability itself. Furthermore, regarding silent reading achievement, although the achievement of the girls was slightly higher than that of the boys, the difference was obviously not significant. The implication of these findings is that girls may very well have no greater ability in language skills as a group than do boys.

IX. SUGGESTIONS FOR FURTHER STUDY

A major goal in undertaking this study and in developing this test was the stimulation of further investigation of phoneme blending. From the limitations of the study as well as from its results a number of suggestions for research, such as the following, may be derived.

The relationship of blending and intelligence was not, and should be examined. Auditory memory and blending should be examined also, although many children who were not able to blend a test item were able to state it in unblended form.

Investigating phoneme blending among mentally-retarded, hard-of-hearing, and brain-injured children as well as among children with articulatory defects would help to refine our understanding of the roles of intelligence, auditory acuity, brain-injury, and articulation in blending.

Relating phoneme blending to oral reading would be useful, since children who have blending difficulty may be able to derive meaning from context in silent reading tests, and thus not reveal the extent of their need for better blending.

Studies might be made of the relationship of phoneme blending of nonsense syllables to phoneme blending of words, perhaps using a word blending test constructed in the light of the criteria used in developing the present test.

Finally, in analyzing the item difficulty of the test, it became clear that some phonemes and combinations of phonemes are more difficult to blend than others. It would be fruitful research to investigate the relative difficulty of blending various combinations of phonemes. This might be most helpful at arriving at certain sequences of blending instruction which teachers of reading might utilize.

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